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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/994,004	11/16/2001	Jeffrey L. Deeney	10015590-1	9058

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
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EXAMINER

NORRIS, JEREMY C

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 10/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/994,004

Applicant(s)

DEENEY ET AL.

Examiner

Jeremy C. Norris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-13, 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These dependent claims all refer to "The apparatus" of either claim 1 or 14. Claims 1 and 14 state "A circuit board assembly". Examiner suggest changing either the preamble of either the independent claims or the dependent claims so that they are in accordance with one another, thus alleviating any antecedent confusion.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by US 5,990,418, granted to Bivona et al. (hereafter Bivona).

Bivona discloses, referring to figure 6, a circuit board assembly, comprising: a circuit board (not shown but referred to; see col. 5, lines 50-60) an integrated circuit package having a substrate (100) with an array of solder columns (112, see figure 1 and col. 5, lines 20-35) extending from a bottom surface of the substrate to the circuit board

when the integrated circuit package is mounted on the circuit board; and at least one support member (602) affixed to at least one of a side of the substrate and a top surface of the substrate when the integrated circuit package is mounted to the circuit board.

Claims 1-3, 9, 10, 17, 18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,239,198, granted to Lin et al. (hereafter Lin).

Lin discloses, referring to figure 4, a circuit board assembly (10), comprising: a circuit board (38) an integrated circuit package having a substrate (12) with an array of solder columns (32) extending from a bottom surface of the substrate to the circuit board when the integrated circuit package is mounted on the circuit board; and at least one support member (36) affixed to at least one of a side of the substrate and a top surface of the substrate when the integrated circuit package is mounted to the circuit board [claim 1], wherein the support member is affixed to the integrated circuit package (figure 4) after the integrated circuit package is mounted to the circuit board by adhesive (figure 3, see col.3, lines 55-65), the adhesive accommodating any variation in height of the integrated circuit package [claim 2], wherein the integrated circuit package has a lid (104) affixed to the substrate, the lid having an outer perimeter that is smaller than an outer perimeter of the substrate, each support member having a flange extending over the upper surface of the substrate, the flange of each support member affixed to at least one of the outer perimeter of the lid and the upper surface of the substrate by adhesive (see col. 5, lines 20-35) [claim 3], wherein the support member comprises a support leg [claims 9, 10].

Additionally, Lin discloses, referring to figure 4, a circuit board assembly (10) having a circuit board (38) and an integrated circuit package, the integrated circuit package having a substrate (12) with an array of solder columns (32) extending from a bottom surface of the substrate to the circuit board, a method of supporting the integrated circuit package against compressive force comprising the step of affixing at least one support member (36) to at least one of a side and a top of the substrate after the integrated circuit package has been mounted on the circuit board, the support member having at least a portion that extends from the substrate to the circuit board [claim 17], wherein the step of affixing the at least one support member includes providing a support member having flanges that extend over a portion of a top of the substrate when the support member is affixed to the at least one of the side and top of the substrate and affixing the flanges to the top of the substrate by adhesive (see col. 5, lines 20-35), the adhesive accommodating any variation in height of the integrated circuit package [claims 18, 20].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

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were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11, 12, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin.

Lin discloses the claimed inventions as described above except Lin does not specifically disclose the number and location of the support members. However, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to place any number of members at any location dictated by the particular application as such modifications would only involve a duplication and rearrangement of the disclosed parts. Furthermore, it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co, v. Bemis Co.*, 193 USPQ 8. Moreover, it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Claims 7 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view US 6,127,204, granted to Isaacs et al. (hereafter Isaacs).

Lin discloses, referring to figure 4, a circuit board assembly (10), comprising: a circuit board (38); an integrated circuit package having a substrate (12) with an array of solder columns (32) extending from a bottom surface of the substrate to the circuit board when the integrated circuit package is mounted on the circuit board, the

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integrated circuit package having a lid (30) affixed to the substrate, the lid having an outer perimeter that is smaller than an outer perimeter of the substrate; and at least one support member (36) affixed to at least one of an outer perimeter of the lid and a top surface of the substrate by adhesive after the column grid array integrated circuit package has been mounted to the circuit board, the adhesive accommodating any variation in height of the integrated circuit package. Lin does not specifically disclose that the integrated circuit package is a column grid array [claim 14]. However, it is well accepted in the art that solder balls and solder columns may be used interchangeably and are thus art recognized equivalents as evidenced by Isaacs (see col. 3. lines 40-50). Therefore, it would have been obvious, to one having ordinary skill in the art, at the time of invention, to substitute a column grid array for the ball grid array in the invention of Lin, since they are art recognized equivalents as evidenced by Isaacs.

Additionally, the modified invention of Lin discloses that each support member has a flange extending over the upper surface of the substrate, the flange of each support member affixed to at least one of the outer perimeter of the lid and the upper surface of the substrate by adhesive (see col. 5, lines 20-35) [claim 15].

Similarly, Lin discloses the claimed invention as described above with respect to claims 3 and 10, except Lin does not specifically state that the integrated circuit package is a column grid array integrated circuit package [claims 7, 13]. However, it is well accepted in the art that solder balls and solder columns may be used interchangeably and are thus art recognized equivalents as evidenced by Isaacs (see col. 3. lines 40-50). Therefore, it would have been obvious, to one having ordinary skill

in the art, at the time of invention, to substitute a column grid array for the ball grid array in the invention of Lin, since they are art recognized equivalents as evidenced by Isaacs.

Allowable Subject Matter

Claim 19 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 4-6, 8, and 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: All of the above mentioned claims include the limitation that the support member must comprise a frame. This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4,164,003	Cutchaw,
US 4,581,680	Garner,
US 4,866,571	Butt,
US 5,905,636	Baska et al.,

US 5,956,576 Toy et al.,

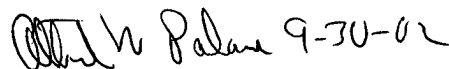
US 5,978,229 Kim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 703-306-5737. The examiner can normally be reached on Mon.-Th., 9AM - 6:30 PM and alt. Fri. 9AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-0725 for regular communications and 703-308-0725 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JCSN
September 28, 2002

 9-30-02

ALBERT W. PALADINI
PRIMARY EXAMINER